

# The Science of Root Canals

For individuals who are experiencing prolonged sensitivity to heat or cold, tenderness when chewing around teeth and gums, discoloration, swelling, or pain, a root canal may be required. However, it's not uncommon to have no warning signs at all. If a root canal is in order, your dentist will refer you to an endodontist, a root canal specialist.

Endodontic treatment focuses on the inside of the tooth. The tooth is made up of an outer enamel layer, and a deeper hard layer called the dentin. Under these outer layers is the tooth's soft tissue, the pulp, which contains nerves, blood vessels, and connective tissue. Made up of living connective tissue and cells called odontoblasts, the pulp is in the center of a tooth. The pulp extends from the crown of the tooth to the tip of the roots where it connects to the tissues surrounding the root. As the tooth develops, it is nourished by the pulp; once fully developed, the tooth is nourished by the surrounding tissue and can survive without the pulp.

Endodontic treatment is necessary when the pulp, the soft tissue inside the root canal, becomes inflamed or infected. The inflammation or infection can have a variety of causes: deep decay, repeated dental procedures on the tooth, or a crack or chip in the tooth. In addition, an injury to a tooth may cause pulp damage even if the tooth has no visible chips or cracks. If pulp inflammation or infection is left untreated, it can cause pain or lead to an abscess, which can damage the surrounding bone and teeth, so it's imperative to treat it immediately.

## The Procedure

Once your endodontist x-rays your tooth and applies anesthetic, the pulp chambers and root canals will be thoroughly cleaned out and shaped after removing the crown of the tooth for access. A thorough cleaning of the chambers and canals prepare the tooth for a filling. Your endodontist then fills the tooth with a material called gutta-percha. This material is applied with a cement-like adhesive to seal off the tooth's root canals. Typically, a temporary filling is placed over the tooth. Your regular dentist will then finish the treatment by applying a permanent crown.

While most teeth can be saved with nonsurgical root canal treatment, in cases of severe trauma, no bone support, or no access to the root canals, your endodontist may need to perform endodontic surgery to locate small fractures or hidden canals that weren't detected on x-rays. With the advanced technologies and procedures today, most teeth can be saved.

Understanding the science of root canals should take the worry out of endodontic treatment. Nothing can ever take the place of your natural teeth, so consult with your dentist or endodontist today and discuss the best option for you.